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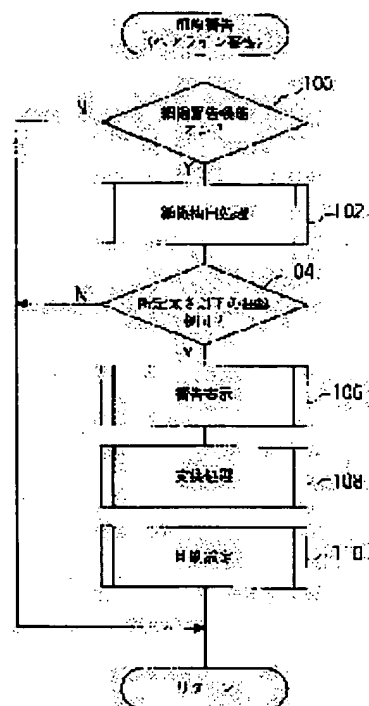
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## (54) IMAGE PROCESSOR

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To properly decide an image which may have blur, loss, etc. generated.

**SOLUTION:** When pixels which constitute a line image which may cause blurring or loss, when they are printed by using a printing plate, a line drawing warning function gives notice, by displaying a warning message on the monitor of a client terminal and so on (steps 100 to 106). Then image conversion and printing setting are performed so that the extracted line drawing becomes clear (steps 108, 110). Consequently, when a proof is generated, an image which possibly causes blur loss on printed matter using the printing plate becomes clear, and proper proofing can be made.



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**CLAIMS**

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[Claim(s)]

[Claim 1] The image processing system carried out [ including an image transformation means to change so that recognition may become possible about it being the image processing system which performs an image processing based on the image data or drawing instruction created at the image-processing terminal, and the line drawing image extracted by extraction means to extract a predetermined line drawing image from the aforementioned image data or the aforementioned drawing instruction, and the aforementioned extraction means being a predetermined line drawing image, and ] as the feature.

[Claim 2] The image processing system which performs an image processing based on the image data or drawing instruction which is characterized by providing the following, and which was created at the image-processing terminal. An extraction means to extract a predetermined line drawing image from the aforementioned image data or the aforementioned drawing instruction. An image transformation means to change into a predetermined picture the line drawing image extracted by the aforementioned extraction means, and a warning means to warn of having carried out image transformation to the line drawing image extracted by the aforementioned extraction means by the aforementioned image transformation means.

[Claim 3] The image processing system according to claim 2 characterized by the aforementioned warning means displaying and notifying of having extracted the aforementioned predetermined line drawing image on the aforementioned image-processing terminal by the aforementioned extraction means.

[Claim 4] The image processing system according to claim 2 or 3 with which the aforementioned image transformation means is characterized by performing image transformation based on a setup of the aforementioned warning means.

[Claim 5] The image processing system given in any of a claim 2 to the claim 4 they are with which the aforementioned conversion means is characterized by changing into the line drawing image of the size more than predetermined the line drawing image extracted by the aforementioned extraction means.

[Claim 6] The image processing system given in any of a claim 2 to the claim 5 they are with which the aforementioned conversion means is characterized by changing into a predetermined color the picture extracted by the aforementioned extraction means.

[Claim 7] An image processing system given in any of a claim 2 to the claim 4 characterized by the aforementioned conversion means eliminating the line drawing image extracted by the aforementioned extraction means they are.

[Claim 8] An image processing system given in any of a claim 2 to the claim 4 characterized by the aforementioned conversion means generating the image data of only the line drawing image extracted by the aforementioned extraction means they are.

[Claim 9] An image processing system given in any of a claim 2 to the claim 8 characterized by extracting the aforementioned line drawing image from the raster data with which the aforementioned extraction means was generated based on the aforementioned image data they are.

[Claim 10] The image processing system according to claim 9 characterized by for the aforementioned extraction means comparing the pixel in a predetermined field with the pattern set up beforehand, and extracting the aforementioned line drawing image.

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done.]



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## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the image processing system which performs the image processing according to the image data or drawing instruction by which various application creation was carried out.

[0002]

[Description of the Prior Art] Digitization permeates also in the field of printing processing and DTP(Desktop Publishing)-ization is progressing. Thereby, by performing creation of a picture, processing, edit, etc., based on this page layout, a page layout is created, a film is created, or it writes in the printing version directly and the lithographic plate for printing is created on processors, such as a personal computer and a workstation, (CPT:Computer to Plate).

[0003] On the other hand, when proofreading in advance of printing using the actual lithographic plate etc., using a WYSIWYG function, a page layout is displayed on a monitor or a printout is carried out with printout equipments, such as a LASER beam printer and a page printer.

[0004] By the way, in printing using the lithographic plate, a thin line can be specified rather than printing which used the printer. That is, by printing using the printer, resolution is about 400dpi-600dpi to the resolution of 2400 or more dpi being obtained in printing using the lithographic plate.

[0005] Therefore, even if it is the thin line which can specify by printing using the lithographic plate, on the printed matter using the printer, it may disappear or a blur may arise.

[0006] For this reason, it is made to change a thin line into the line of the size in which an output by the printer is possible, and is made for this to prevent generating of disappearance of a thin line, a blur, etc. in JP,6-231238,A at the time of printing using the printer.

[0007]

[Problem(s) to be Solved by the Invention] However, when the printed matter which changed the thin line which cannot be expressed with a printer into the thin line which can be expressed with a printer, and performed printing processing will differ from the printed matter which used the lithographic plate, for example, a lithographic plate is used, even if it is the line drawing image of the thinness which a blur etc. produces, it will be expressed as a line drawing image which a blur does not produce by the printed matter created using the printer.

[0008] Moreover, when the thin line which cannot only be outputted by the printer is changed into the size in which an output is possible by the printer and it is printed using a lithographic plate, even the narrow line drawing image which a blur etc. produces may output. For this reason, it is indefinite which portion is different until it cannot check how it appears in printed matter, but it actually creates a lithographic plate as well as exact proofreading becoming difficult and it performs printing processing.

[0009] When using a lithographic plate when performing an image processing etc. based on the image data or drawing instruction which this invention was made in view of the above-mentioned fact, for example, was created at image-processing terminals, such as a workstation and a personal computer, and printing, it aims at proposing the image processing system with which it becomes clear that it is the line drawing image which a blur etc. produces and carries

[Solving the Problem] It carries out containing an image-transformation means change so that recognition of the line drawing image extracted by extraction means this invention is an image processing system which performs an image processing based on the image data or the drawing instruction created at the image-processing terminal, and the line drawing image from the aforementioned image data or the aforementioned drawing instruction. The aforementioned extraction means may be attained [ that it is a predetermined line drawing image

and ], in order to attain the above-mentioned purpose as the feature.

[0011] According to this invention, image transformation is performed so that the line drawing image extracted for the extraction means may become clear [ that it is a predetermined line drawing image ]. When printing processing is carried out by performing image transformation using the printer of a low resolution so that it may become clear that it is the line drawing image which a blur produces by this when it prints using a lithographic plate, it can clarify that this picture is a picture which a blur and disappearance may produce on the printed matter which used the lithographic plate.

[0012] Moreover, an extraction means for the image processing system of this invention to be an image processing system which performs an image processing based on the image data or drawing instruction created at the image-processing terminal, and to extract a predetermined line drawing image from the aforementioned image data or the aforementioned drawing instruction, It is characterized by including an image transformation means to change into a predetermined picture the line drawing image extracted by the aforementioned extraction means, and a warning means to warn of having carried out image transformation to the line drawing image extracted by the aforementioned extraction means by the aforementioned image transformation means.

[0013] If an extraction means extracts the predetermined line drawing image set up beforehand based on image data or a drawing instruction according to this invention, it will warn by the warning means. When the picture which a blur, disappearance, etc. produce on the printed matter created using the lithographic plate by this is extracted, it can notify of it and warn of extraction of an applicable line drawing image.

[0014] Therefore, proper proofreading is attained even if it performs a proof using printout equipments, such as a printer with resolution lower than the printed matter using the lithographic plate.

[0015] In such this invention, the aforementioned warning means may display and notify of having extracted the aforementioned predetermined line drawing image on the aforementioned image-processing terminal by the aforementioned extraction means, image transformation may be performed so that the picture extracted may become clear, and these may be doubled and you may carry out. That is, the aforementioned warning means may set up image transformation.

[0016] As such image transformation, the aforementioned conversion means may change into the line drawing image of the size more than predetermined the line drawing image extracted by the aforementioned extraction means, and may change into a predetermined color the picture extracted by the aforementioned extraction means, and may carry out by doubling these conversion.

[0017] Furthermore, you may generate the image data of only the line drawing image which could eliminate the line drawing image extracted by the aforementioned extraction means as a conversion means, and was extracted by the aforementioned extraction means.

[0018] Furthermore, you may specify any of these conversion methods they are from an image-processing terminal.

[0019] On the other hand, the aforementioned extraction means may extract the aforementioned line drawing image from the raster data generated based on the aforementioned image data, and may extract it from description of a drawing instruction. Moreover, when extracting from raster data, the pixel in a predetermined field may be compared with the pattern set up beforehand, and not only this but the conventionally well-known arbitrary picture extraction methods can be used.

[0020]

[Embodiments of the Invention] Hereafter, the form of this invention field operation is explained. The outline composition of the printing system 10 applied to the form of this operation is shown in drawing 1 . This printing system 10 is equipped with the image processing system 32 which added and constituted the PCI board which equipped the personal computer (PC) of general composition with the predetermined function. Moreover, the printout of the picture which the printer 14 was connected to this image processing system 32 as printout equipment, and was processed with the image processing system 32 is possible.

[0021] Furthermore, a personal computer, a workstation, etc. consider as the client terminal 16, and are connected to the image processing system 32. This client terminal 16 is used for DTP which performs image processings, such as creation of a picture, processing, and edit, using various applications. An image processing system 32 performs the image processing for performing printing processing based on the drawing instruction from the client terminal 16 of \*\*\*\*\*.

[0022] That is, the image processing system 32 consists of printing systems 10 in the print server 12. In addition, through the bidirectional interfaces 18, such as Ethernet (registered trademark) (Ethernet (registered trademark)), two or more sets of printers 14 may be connected to the print controller 20, and, as for a print server 12, the network of two or more client terminals 16 is carried out for LAN, WAN, etc. to it through a network interface 22.

[0023] External memory, such as ROM, RAM, and HD, is prepared, and such a print server 12 operates by the

operation rating program memorized to ROM, and performs processing to a system chart form, an image, a character, or a table based on the program memorized by ROM or external memory. Moreover, the print server 12 is equipped with display devices, such as input devices, such as a keyboard and a mouse (all are illustration abbreviations), and a CRT display. Moreover, also in a print server 12, the printing processing to the display image of a display device is possible.

[0024] The image-processing section 24 is formed in an image processing system 32, and the image-processing section 24 generates raster data from image data to it based on a drawing instruction. The printed matter based on image data is obtained by this raster data's being controlled by the print controller 20, and outputting it to a printer 14.

[0025] On the other hand, the client terminal 16 performs image processings, such as creation of a picture, processing, and edit, using various kinds of DTP applications, such as Photoshop, Illustrator (all are the tradenames of U.S. Adobe Systems), and QuarkXPress (tradename of the U.S. quark company). At this time, such applications create the page layout of PostScript form etc.

[0026] In this example, the page layout created with this client terminal 16 is used for creation of the film used for exposure of the printing version by the color photoelectric-process system (CEPS), and exposure of the printing version in direct platemaking (CPT). Printing processing is made by the lithographic plate created based on this page layout.

[0027] In a color photoelectric-process system and a direct platemaking system, the proof which creates the printed matter for proofreading (it considers as a "proof" below) called color proof etc. is performed in advance of the creation of a lithographic plate based on the page layout created with the client terminal 16.

[0028] When performing this proof, the image file which contains a page layout with a drawing instruction from the client terminal 16 is outputted to a print server 12 as a printing job. Thereby, a print server 12 performs printing processing based on the page layout.

[0029] The page layout inputted from the client terminal 16 may be YMCK form, and you may be RBG form, and these may be intermingled further. In the image-processing section 24, based on a drawing instruction, the raster data of each color of Y, M, C, and K are generated from this page layout, and it outputs to a printer 14.

[0030] By the way, the image processing system 32 is equipped with the thin-line warning function called for example, a hairline warning function etc. as one of the printing functions. This thin-line warning function is constituted by the detailed picture extraction section 26, the detailed image transformation section 28, and the warning process section 30.

[0031] The detailed picture extraction section 26 extracts the pixel which forms a predetermined thin-line picture out of the raster data created in a drawing instruction or the image-processing section 24. When the lithographic plate of the detailed picture extraction section 26 applied to the form of this operation is carried out, of course when carrying out the printout of the proof by the printer 14, and it prints, it extracts the thin line which may not become blurred on printed matter and may produce disappearance. In addition, the line drawing images extracted with the form of this operation may be a straight line and radii, and may be the curves of various configurations.

[0032] Moreover, the detailed image transformation section 28 performs predetermined processing to the picture formed of the pixel which the detailed picture extraction section 26 extracted. Moreover, the warning process section 30 performs a warning process so that it may become clear to have extracted the detailed picture in the detailed picture extraction section 26. It is made for the picture of the proof which this outputs by the printer 14 formed in a proof to become clear [ differing from the original page layout ].

[0033] Here, an example of processing to the thin line in an image processing system 32 etc. is explained, referring to a drawing. In addition, although the example which extracts the line drawing image below a predetermined size is explained below from the raster data created based on image data and the drawing instruction in the image-processing section 24, the thin-line extraction in this invention may perform thin-line extraction from description of not only this but a drawing instruction etc.

[0034] The flow of fundamental processing of thin-line warning is shown in drawing 2. In this flow chart, when it checks whether the thin-line warning function is set up and the thin-line warning function is set up at the first step 100, it shifts to affirmation judging) and Step 102 at the (step 100, and the pixel which forms a narrow line drawing image is extracted from the generated raster data. Moreover, at Step 104, it checks whether the pixel which forms the thin line of the size below predetermined has been extracted.

[0035] Here, if the thin line (pixel which forms a thin line) used as the size below predetermined is extracted, an affirmation judging will be carried out at Step 104, and it will shift to Step 106. In addition, when there is no thin line below predetermined, a negative judging is carried out at Step 104, and a thin-line warning process is ended.

[0036] At Step 106, it notifies of having extracted the thin line of the size below predetermined. This notice displays the warning message which warns of the thin line which a blur etc. may produce existing on the monitor which the

client terminal 16 which requested the printing job does not illustrate.

[0037] At the following step 108, processing to the line drawing image formed of the extracted pixel is performed. The picture which corresponds on the printed matter outputted from a printer 14 as this processing, for example is eliminated, or it is made to become [ \*\*\*\* / changing into a thick line ] the warning picture of changing a color so that the corresponding picture may become clear. Moreover, it extracts so that the corresponding thin line may become clear, and it may be made to perform image transformation so that a printout may be carried out independently.

[0038] At Step 110, an end of image transformation performs a printing setup so that the printout of the picture according to the contents of conversion may be carried out.

[0039] Even if the printout is carried out by this as a picture which neither a blur nor disappearance has produced from the printer 14, \*\*\*\* of possibility that a blur and disappearance will arise can be clarified on the printed matter using the lithographic plate. Moreover, proper proofreading is attained by clarifying such a picture.

[0040] Generally, although about [ 1200dpi-3600dpi ] resolution is obtained in printing using the lithographic plate, resolution is about 400dpi-600dpi by the printers 14, such as a color laser printer and a page printer. Moreover, a picture with the printout more detailed than the resolution of a printer 14 from a printer 14 is changed into a picture according to the resolution of a printer 14.

[0041] For this reason, in the page layout created at the client terminal 16, a blur and disappearance will arise a blur and on the printed matter using the lithographic plate even if it was the line drawing image which is not disappearance drawing student \*\*\*\*\*.

[0042] On the other hand, it is made possible [ proper proofreading ] for a thin-line warning function by extracting the line drawing image which may produce a blur and disappearance on the printed matter which used the lithographic plate, and emitting warning.

[0043] Here, the example of thin-line warning is explained. In an image processing system 32, as a thin-line warning function, when the line drawing image below predetermined is extracted, the warning message which shows that the thin line was extracted is displayed on the monitor which the client terminal 16 does not illustrate. Moreover, when the image processing to the extracted thin line is set up, it is made clear [ on the printed matter (proof) outputted from a printer 14 / the corresponding picture ] by performing the image processing based on a setup.

[0044] Such a thin-line warning function is set up by the dialog shown in drawing 3 (A) and drawing 3 (B) when outputting a printing job from the client terminal 16.

[0045] While eliminating a thin line as processing to a thin line in an image processing system 32 on "elimination" of the extracted thin line, "extraction" which carries out the printout only of the extracted thin line as a warning page independently, and a proof, it is selectable any of the "warning" which changes "elimination + extraction" which carries out the printout of the thin line extracted independently, and the extracted thin line so that it may become aposematic coloration or a thick line they are. Moreover, when "warning" is chosen, a setup of the size of the line when changing a thin line into a thick line and the color when changing into aposematic coloration is attained, and it is made clear on the printed matter which the corresponding thin line outputs from a printer 14 by this.

[0046] Moreover, a setup of the threshold of the thin line extracted in this thin-line warning function is possible. In addition, when the specification of processing of warning classification is attained with the pull down menu and it performs the numerical input of a threshold, selection of the size of the thin line to extract is possible.

[0047] The outline of processing over the thin line which the thin line from the raster data generated in the image-processing section 24 extracted and extracted is shown in drawing 4 . Moreover, the outline of image transformation processing over the thin line extracted when extracting a thin-line picture is shown in drawing 5 . In addition, pixel extraction can show an example and can apply not only this but conventionally well-known arbitrary algorithms.

[0048] When an image processing system 32 performs image transformation, the original raster data are stored in image-memory Sc, and the raster data based on the specified processing are stored in an image memory Dc. Moreover, when it is a color picture, thin-line extraction is performed to the raster data of 4 classification by color (the color counter c= 0, 1, 2, 3) of C, M, Y, and K. In addition, below, the element data of the pixel (coloring pixel) which forms a picture are made into "black", and the element data of the pixel (non-coloring pixel) used as a non-picture portion are explained as "white."

[0049] Here, pixel extraction checks whether the element data of these attention pixels di and j are "black" (picture portion), or it is "white" (non-picture portion) on the raster data shown in drawing 6 paying attention to the arbitrary pixels di and j (it considers as "the attention pixels di and j" below). When resolution of the printed matter using the lithographic plate is set to 2400dpi at this time, pixel extraction which forms a thin line from the raster data of 1200dpi is performed.

[0050] In addition, the range (mxn pixel :  $0 \leq i \leq m-1$ ,  $0 \leq j \leq n-1$ ) which performs pixel extraction may be made to perform pixel extraction in order in each field which may be 1 page of a proof, and divided and divided 1 page into

plurality. In addition, when raster data are considered as 1 page, the pixel of the field (field applicable to the margin portion of the periphery section of a proof) which separated from the  $m \times n$  pixel makes the element data "white."

[0051] When the element data of the attention pixels  $d_i$  and  $j$  are "black", it judges whether it is the pixel in which the attention pixels  $d_i$  and  $j$  form [ the attention pixels  $d_i$  and  $j$  ] a thin line for \*\*\*\* from the element data in the field of a  $p \times q$  pixel (for example,  $3 \times 3$  pixels shown in drawing 6 as a solid line).

[0052] At this time, in the detailed picture extraction section 26, the mask pattern shown in drawing 7 is memorized, and it judges in it whether it is the pixel in which the attention pixels  $d_i$  and  $j$  form a thin line from whether the predetermined field containing the attention pixels  $d_i$  and  $j$  corresponds to which mask pattern. In addition, drawing 7 shows the mask pattern to a  $3 \times 3$ -pixel field as an example.

[0053] The flow chart shown in drawing 4 is in the state where the thin-line warning function was turned on, if the raster data of each color of C, M, Y, and K are generated, it will be performed, and it performs initial setting at the first step 120. In this initial setting, the color counter  $c$  is reset with the line variable  $i$  and a string variable  $j$  ( $i=0$ ,  $j=0$ ,  $c=0$ ). In addition, the color counter  $c$  is set to  $c=0$ , and 1, 2 and 3 as what is performed about four colors of C, M, Y, and K.

[0054] Then, in Step 102, the element data of the attention pixels  $d_i$  and  $j$  specified by the line variable  $i$  and the string variable  $j$  are read, and it judges whether this element data is "black" at Step 124. When the element data of the attention pixels  $d_i$  and  $j$  are the pixel of a non-picture portion in "white", while carrying out a negative judging at Step 124, shifting to Step 126 and incrementing a string variable  $j$  at this time, a string variable  $j$  checks whether it is the no which reached the predetermined value  $n$  at Step 128.

[0055] Thereby, when the judgment to the attention pixels  $d_i$  and  $j$  for one train is not completed, an affirmation judging is carried out at Step 128, it shifts to Step 122, and the judgment to the following attention pixels  $d_i$  and  $j$  is performed. Moreover, when the judgment to the attention pixels  $d_i$  and  $j$  for one train is completed, a negative judging is carried out at Step 128, and it shifts to Step 130.

[0056] At this step 130, while resetting a string variable  $j$  ( $j=0$ ), the increment ( $i=i+1$ ) of the line variable  $i$  is carried out, and in Step 132, when it judges whether the line variable  $i$  reached the predetermined value  $m$  and the judgment to the attention pixel for one line is not completed, an affirmation judging is carried out at Step 132, and it shifts to Step 122. Moreover, after the judgment to the attention pixels  $d_i$  and  $j$  for one line is completed, an affirmation judging is carried out at Step 132, and it shifts to Step 134.

[0057] At Step 134, while resetting the line variable  $i$  and a string variable  $j$ , the color counter  $c$  is incremented. At Step 136, it checks whether the color counter  $c$  is under a predetermined value, when it is under a predetermined value, after the judgment to the raster data of all colors is not completed, it judges (it is an affirmation judging at Step 136), and it shifts to Step 122. Moreover, after the judgment to the raster data of each color of C, M, Y, and K is completed, a negative judging is carried out at Step 136, and extraction processing of a thin picture is ended.

[0058] On the other hand, the element data of the attention pixels  $d_i$  and  $j$  carry out an affirmation judging to it being "black" at Step 124, and shift to Step 138. At this step 138, the element data of the pixel ( $3 \times 3$  pixels as [ The form of this operation ] an example) of the predetermined field centering on the attention pixels  $d_i$  and  $j$  are read. Then, at Step 140, the pattern applicable to the pattern which the pixel of a predetermined field forms is compared with the mask pattern set up beforehand, and in Step 142, when it checks whether there is any coincidence pattern and there is no coincidence pattern, a negative judging is carried out at Step 142, and it shifts to Step 126.

[0059] On the other hand, when there is a coincidence pattern, an affirmation judging is carried out at Step 142, and it sets up that it is the pixel in which it shifts to Step 144 and the corresponding attention pixels  $d_i$  and  $j$  form a thin line.

[0060] In an image processing system 24, while emitting the warning which shows that the thin line was extracted based on this setting result, processing to this extracted pixel is performed.

[0061] An example of transform processing to the picture formed in drawing 5 of the extracted pixel is shown. In addition, in the image transformation processing explained below, it considers as the number  $W_w$  of pixels of the size when changing a thin line into a thick line, and each color component (each color component of C, M, Y, and K) of the color to change is set to  $W_c$  ( $c=0-3$ ).

[0062] This flow chart is set as the raster data of the first color picture by resetting the color counter  $c$  at the first step 150. Then, it checks whether it is elimination of the picture which the specified processing extracted at Step 152, and checks whether it is conversion in a warning picture at the following step 154.

[0063] Here, if set as elimination of the extracted picture, an affirmation judging will be carried out at Step 152, and it will shift to Step 156. At this step 156, the data of image-memory  $S_c$  are copied to an image memory  $D_c$ , and the extracted attention pixels  $d_i$  and  $j$  are read in Step 158. Then, at Step 160, the element data of the attention pixels  $d_i$  and  $j$  are changed into "white" from "black", and a conversion result is stored in image memories  $d_i$  and  $j$  as element data of Pixels  $d_i$  and  $j$  with which an image memory  $D_c$  corresponds.



[0064] Then, at Step 162, when it checks whether there are the following attention pixels (extracted pixel)  $d_i$  and  $j$  and there are extracted attention pixels  $d_i$  and  $j$ , an affirmation judging is carried out at Step 162, it shifts to Step 158, and processing to the following attention pixels  $d_i$  and  $j$  is performed.

[0065] Thus, if the image processing to the raster data of 1 classification by color is completed and a negative judging is carried out at Step 162, after shifting to Step 164 and incrementing the color counter  $c$ , it checks whether the value of the color counter  $c$  is under a predetermined value (Step 166).

[0066] The image data from which the line drawing image formed of the extracted attention pixels  $d_i$  and  $j$  was deleted is obtained by this changing the element data of the attention pixels  $d_i$  and  $j$  extracted about each color of C, M, Y, and K.

[0067] When specified that it obtains the printed matter (warning page) which, on the other hand, extracted the line drawing image formed of the attention pixels  $d_i$  and  $j$  as transform processing, a negative judging is carried out at Steps 152 and 154, and it shifts to Step 168. At this step 168, the data of the image memory  $D_c$  which stores the changed picture are cleared. Thereby, it is set up so that the printed matter of a blank paper may be obtained.

[0068] Then, at Step 170, the element data of the extracted attention pixels  $d_i$  and  $j$  are read, and the element data of these attention pixels  $d_i$  and  $j$  are stored as element data of Pixels  $d_i$  and  $j$  with which it corresponds in an image memory  $D_c$  (Step 172).

[0069] Moreover, at Step 174, when it checks whether there are the remaining attention pixels  $d_i$  and  $j$  and there are attention pixels  $d_i$  and  $j$ , an affirmation judging is carried out and it shifts to Step 170. Moreover, at Step 176, by incrementing the color counter  $c$ , it is set as the following color and it is checked by Step 178 whether the image transformation to all colors has been completed.

[0070] Thus, by performing image transformation, the raster data with which the output of the printed matter with which only the thin line was extracted is attained are generated by the image memory  $D_c$ .

[0071] When such an image processing or not picture extraction but conversion in a warning picture is specified, after a negative judging is carried out at Step 152, an affirmation judging is carried out at Step 154, it shifts to Step 180, and the data of image-memory  $S_c$  (image memories  $S_0$ ,  $S_1$ ,  $S_2$ , and  $S_3$ ) are copied to an image memory  $D_c$  (image memories  $D_0$ ,  $D_1$ ,  $D_2$ , and  $D_3$ ).

[0072] Then, in Step 182, while reading the extracted attention pixels  $d_i$  and  $j$ , line breadth  $W_w$  is set up at Step 184. In addition, when there is no specification of line breadth  $W_w$  without changing into a thick line, it is set to line breadth  $W_w=1$  and becomes  $a=i$  and  $b=j$ .

[0073] At the following step 186, the element data of Pixels  $d_a$  and  $b$  are set as "black", and data are copied to the pixel to which an image memory  $D_c$  corresponds.

[0074] Moreover, at Step 188, when it checks whether conversion to the aposematic coloration which is color conversion to the extracted thin line is specified and conversion to aposematic coloration is specified, an affirmation judging is carried out at Step 188, and it shifts to Step 190. At this step 190, the data of Pixels  $d_a$  and  $b$  are changed into the data according to the aposematic coloration  $W_c$  (aposematic coloration  $W_0$ ,  $W_1$ , and  $W_2$ ,  $W_3$ ) specified, and are copied to an image memory  $D_c$  (image memories  $D_0$ ,  $D_1$ ,  $D_2$ , and  $D_3$ ).

[0075] Then, at Step 192, the increment ( $b=b+1$ ) of the string variable  $b$  is carried out, and it checks whether it is in the line breadth  $W_w$  to which the direction of a train is set in Step 194. Moreover, at Step 196, while returning to the first value (value set up at Step 184) at a string variable  $b$ , the increment ( $a=a+1$ ) of the line variable  $a$  is carried out, and it checks whether it is in the line breadth  $W_w$  to which the direction of a train is set in Step 198.

[0076] Transform processing to the pixel centering on the attention pixels  $d_i$  and  $j$  is performed until the line drawing image of predetermined width of face is formed focusing on the extracted attention pixels  $d_i$  and  $j$  by this (while the affirmation judging is carried out at Step 194 or Step 198).

[0077] Moreover, when the color counter  $c$  checks whether it is under a predetermined value and has not reached a predetermined value after shifting to Step 202 and incrementing the color counter  $c$  if the existence of the following attention pixels  $d_i$  and  $j$  is checked, transform processing to the attention pixels  $d_i$  and  $j$  is completed at Step 200 and a negative judging is carried out at Step 200, it shifts to Step 182 and processing to the following color is performed.

[0078] Thus, while changing into the printed matter which changed into aposematic coloration the thin line extracted by performing image transformation, the printed matter which changed the extracted thin line into the thick line, or the thick line, when the printed matter changed into aposematic coloration can be obtained and printing processing is carried out with this printed matter using a lithographic plate, the picture which a blur and disappearance may produce becomes clear.

[0079] Therefore, the proper proofreading to image data is attained with the proof outputted from a printer 14.

[0080] In addition, although the above explanation explained that it was on a drawing instruction and the processing to the picture extracted based on the thin-line warning function was set up beforehand, the thin-line warning function may



be beforehand set up by the print server 12. That is, a print server 12 may perform ON/OFF setup of a thin-line warning function, and specification of an resolution picture from the application which created image data or the drawing instruction, and the client terminal 16 irrespective of the existence of a setup of the thin-line warning function on a drawing instruction.

[0081] Moreover, although the form of this operation explained that transform processing of a picture was specified, ON/OFF of a thin-line warning function should just be set up at least. In this case, what is necessary is just to require the specification input of transform processing, when a predetermined thin line is extracted and warning is emitted to the client terminal 16 by the thin-line warning function.

[0082] That is, as shown in the flow chart of drawing 8, pixel extraction is performed and it warns of the thin line below predetermined (Step 112). If the menu which chooses transform processing on the monitor of the client terminal 16 is set and displayed at this time and specification of transform processing is inputted from the client terminal 16, it will shift to Step 114 and specification of transform processing will be read. What is necessary is just to perform transform processing based on specification to next at Step 108.

[0083] Moreover, you may make it display the preview screen where the extracted line drawing image becomes clear on the client terminal 16. In this case, you may enable it to specify the stop of printing processing from the client terminal 16.

[0084] In addition, the gestalt of this operation explained above does not limit the composition of this invention. For example, with the gestalt of this operation, although creation of a proof was explained to the example, if it warns that the content of conversion becomes clear to compensate for transform processing to the corresponding picture when it judges that a blur etc. may arise in the picture which carries out a printout to the various drawing instructions not only from a proof but the client terminal 16, it is applicable to arbitrary composition.

[0085] Moreover, although the gestalt of this operation explained to the print server 12 with the application of the image processing system of this invention this invention is not what is restricted to this. the image processing system of this invention To for example, the middle server arranged between two or more client terminals 16, a print server, or a print You may prepare as an image processing system processed based on the image data inputted from a client terminal. Moreover, it may prepare on a network with the client terminal 16, and you may use as an image processing system which performs predetermined processing to the image data inputted from a client terminal.

[0086]

[Effect of the Invention] If the picture of the line drawing image with which a blur, disappearance, etc. may produce a lithographic plate on the printed matter by which a printout is created and carried out, for example is extracted according to this invention as explained above, warning will be emitted so that this picture may become clear.

Moreover, when a proof etc. is performed by performing image transformation so that this picture may become clear, the outstanding effect that exact proofreading is attained is acquired.

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[Translation done.]

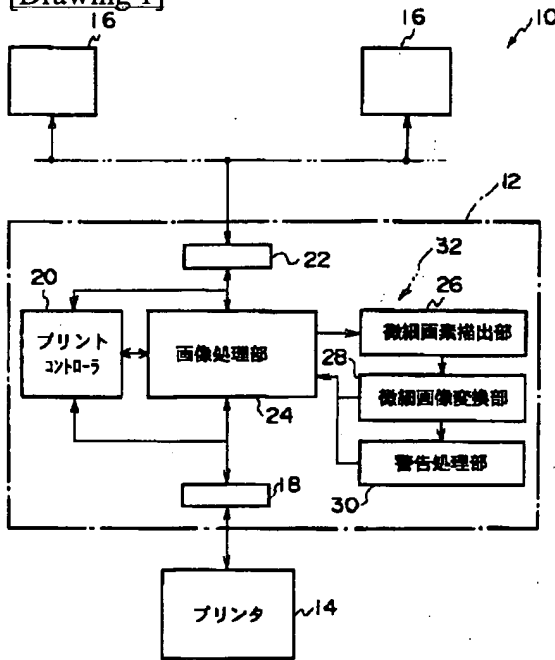
## \* NOTICES \*

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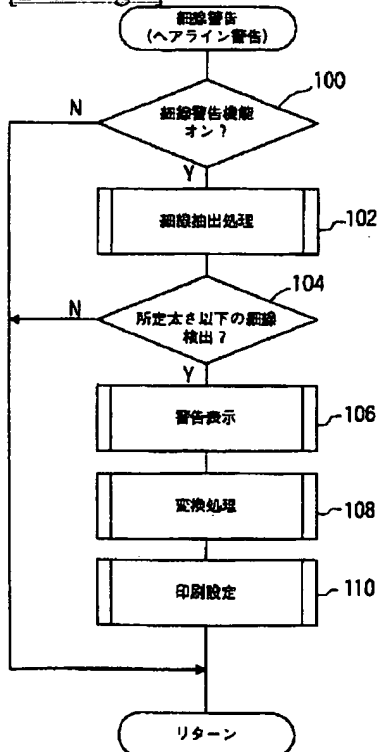
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DRAWINGS

[Drawing 1]



[Drawing 2]



[Drawing 3]

(A)

詳細設定

カラー

用紙/排出処理

出力指定

画質

ヘアイン警告

ユーザー情報

☒ヘアイン警告

警告種別

消去

警告しきい値

警告色

警告色

消去

消去

消去

消去+抽出 (該当時)

警告色 (情報表示)

C

0

M

100

Y

0

K

0

線幅

9

pt

設定

キャンセル

(B)

詳細設定

カラー

用紙/排出処理

出力指定

画質

ヘアイン警告

ユーザー情報

☒ヘアイン警告

警告種別

警告色

警告しきい値

0.09 pt

警告色

C

0

M

100

Y

0

K

0

線幅

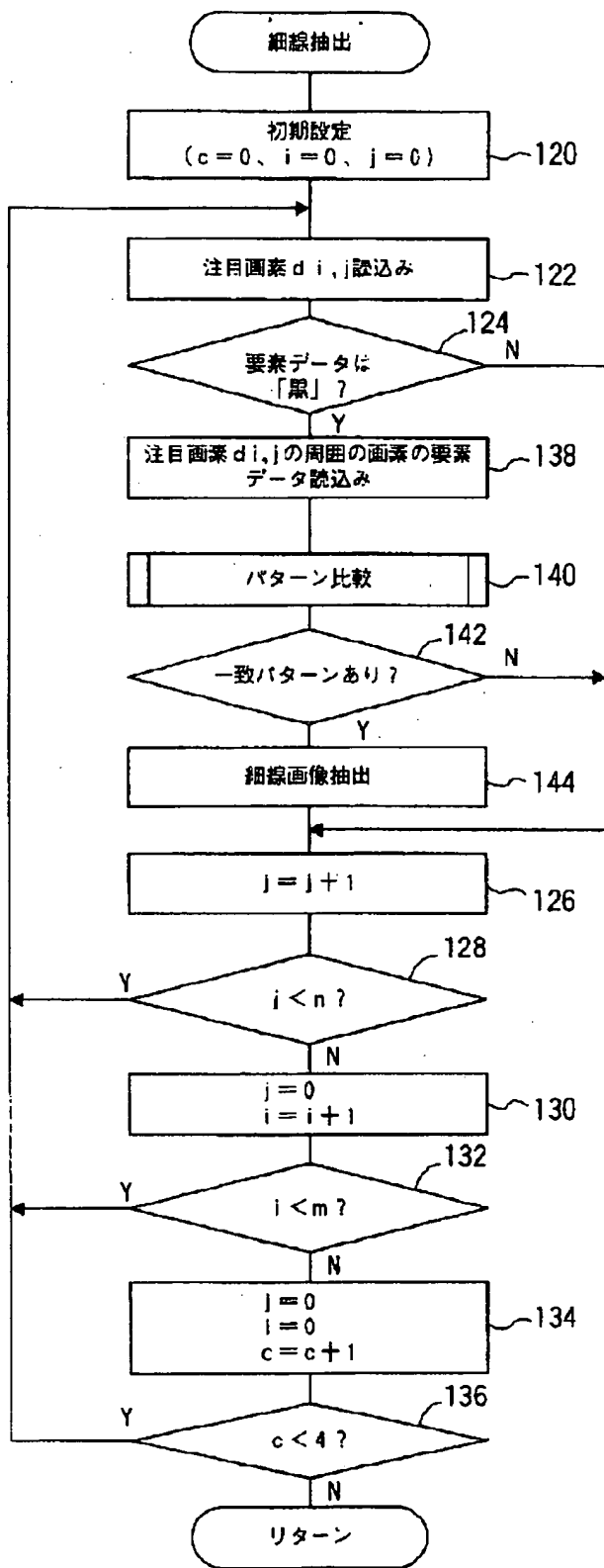
9

pt

設定

キャンセル

[Drawing 4]



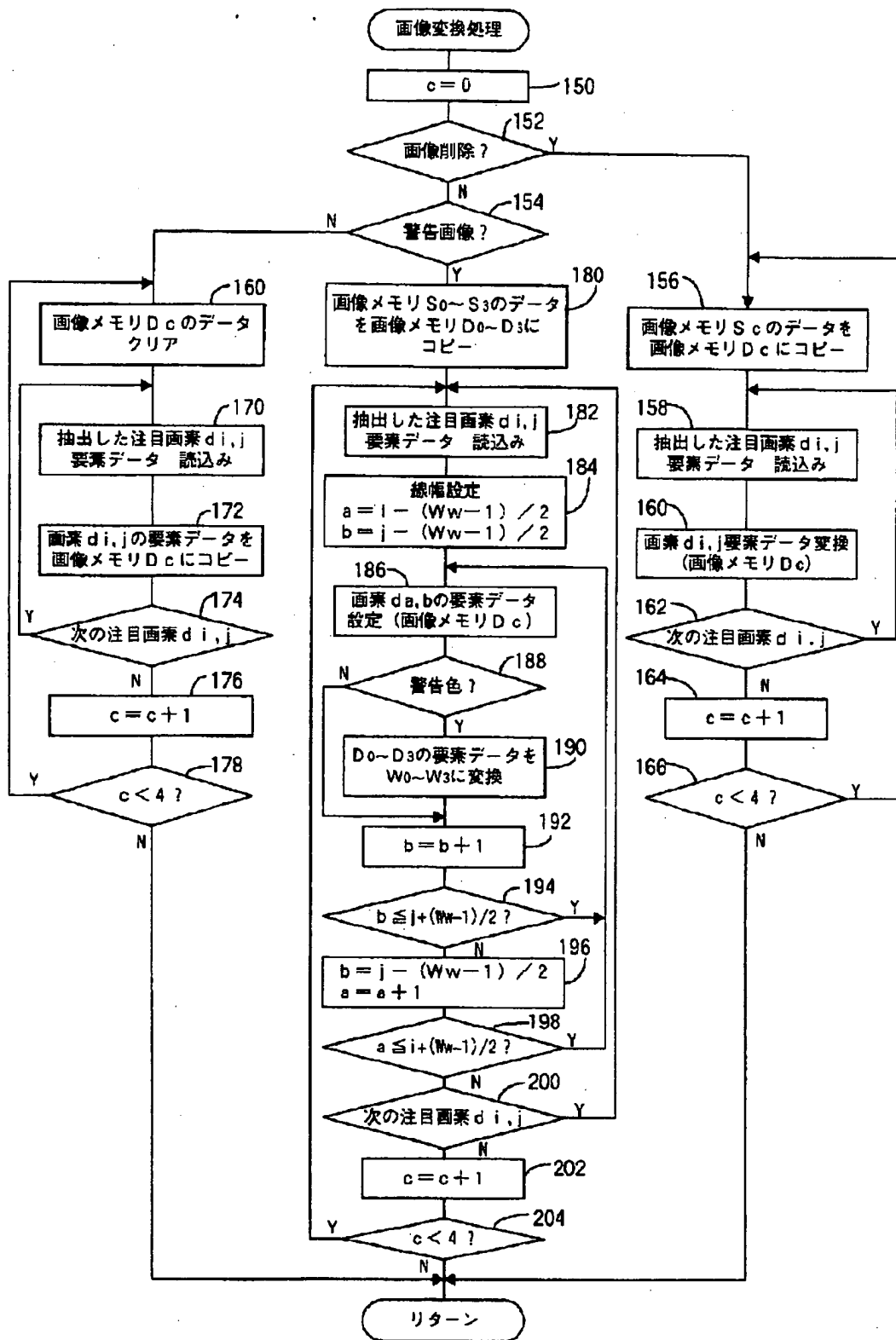
[Drawing 6]

$n$								
$d_{0,0}$	$d_{0,1}$						$d_{0,n-2}$	$d_{0,n-1}$
$d_{1,0}$								$d_{1,n-1}$
			$d_{i-1,j-1}$	$d_{i-1,j}$	$d_{i-1,j+1}$			
			$d_{i,j-1}$	$d_{i,j}$	$d_{i,j+1}$			
			$d_{i+1,j-1}$	$d_{i+1,j}$	$d_{i+1,j+1}$			
$d_{m-2,0}$								$d_{m-2,n-1}$
$d_{m-1,0}$	$d_{m-1,1}$						$d_{m-1,n-2}$	$d_{m-1,n-1}$

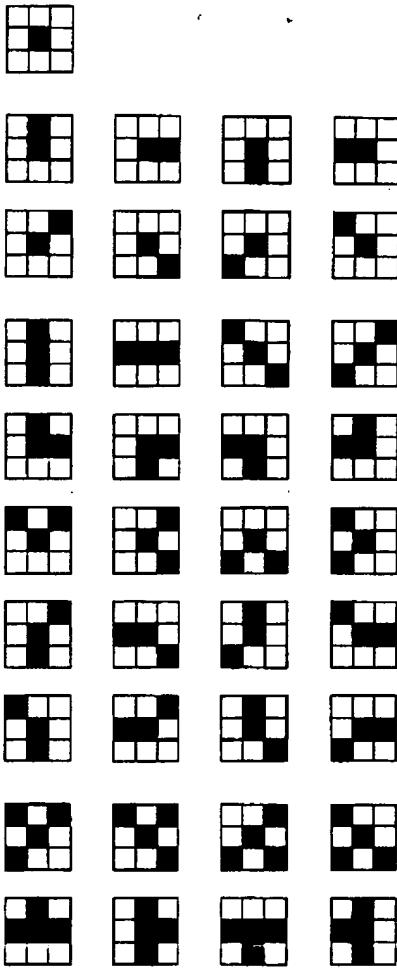
$m$

$\uparrow$   
 $Sc(Dc)$

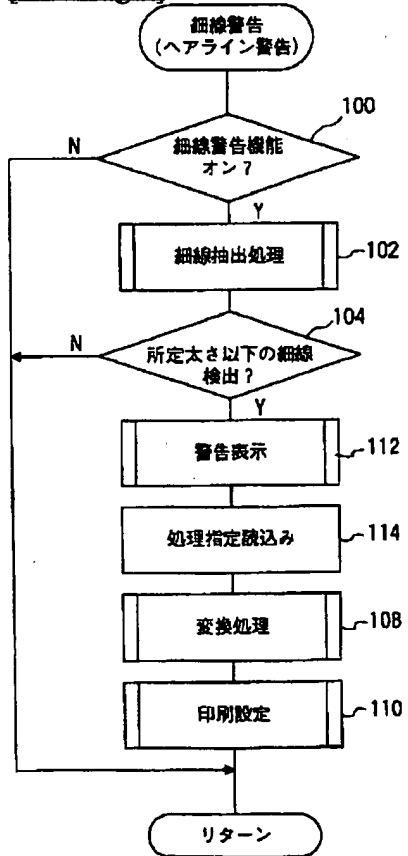
[Drawing 5]



[Drawing 7]



[Drawing 8]





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[Translation done.]